Space Weather Forecast

Issued on Wednesday, 26 January 2022 at 00:27 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Slight chance G1/Minor Geomagnetic Storm, mainly Days 1 and 3 (26th and 28th). Slight chance throughout of Moderate-class flares.

Analysis of Space Weather Activity over past 24 hours
Solar Activity: Solar activity has been Low in the past 24 hours with several Common-class flares, the strongest just recently from a region over the northeast limb. There are four regions currently on the visible side. One region just west of north centre disc, was the source of a minor flare and associated Coronal Mass Ejection (CME) around 25/0220 UTC, but has shown little development since. A region in the southeast quadrant developed over the last 24 hours, and is continuing to develop further. Two further regions have been largely inactive. The CME mentioned above has been assessed as likely passing over the Earth, but with a chance of a glancing arrival around 29/0000UTC +/- 9 hours.

Solar Wind / Geomagnetic Activity: The solar wind was indicative of the glancing influence of a CME until 25/0400 followed by the arrival of the fast wind from a coronal hole. Wind speeds were initially slow, but have been increasing since 25/0400 UTC, reaching near 500 km/s. Total Interplanetary Magnetic Field strength has been weak to moderate, but has eased to become weak since 25/1730 UTC. The important north-south component has varied moderately, but has been more often southwards directed. Despite this geomagnetic activity remained generally Quiet to Unsettled (Kp 2-3).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background with no solar radiation storms were observed.

Four-Day Space Weather Forecast Summary
Solar Activity: Solar activity is expected to remain Low, with four active sunspot regions on the visible disc, and potentially two further regions likely to rotate on. There is a slight chance of Moderate-class flares.

Solar Wind / Geomagnetic Activity: The current enhancement from the fast wind of a coronal hole is expected to continue early Day 1 (26th), before very gradually easing, although there is also the potential for a weak glancing impact early in this period from a CME. The next notable enhancement will be from the arrival of the fast wind of a further coronal hole, either late Day 2 or on Day 3 (27-28th), with the potential for another weak CME to glance across Earth late on Day 3. This is currently considered more likely to miss however, with only a very slight chance of impact. Quiet to Active conditions at first on Day 1, with a slight chance of isolated G1/Minor Storm intervals mainly if we see an influence from the passing CME. Activity is then expected to be Quiet to Unsettled, before increasing again to Unsettled to Active with a slight chance of G1/Minor Storm intervals with any fast wind arrival or CME influence mainly on Day 3.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to remain at background with no solar radiation storms occurring.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	20	5	20	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	15	15	15	15
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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